

SCHEDULE 10 IRRIGATION STANDARDS

10. GENERAL

Furnish all labour, materials, equipment, permits and services necessary for the complete supply and installation of a properly operating irrigation system as indicated on the drawings and specified herein.

10.1. RELATED WORK

10.1.1. Unit Paving	Section 321401
10.1.2. Concrete Walks, Curbs And Gutters	Section 033020
10.1.3. Topsoil And Finish Grading	Section 329121
10.1.4. Seeding	Section 329220
10.1.5. Hydraulic Seeding	Section 329219
10.1.6. Sodding	Section 329223
10.1.7. Planting Of Trees, Shrubs And Groundcovers	Section 329301

10.2. QUALITY ASSURANCE

- 10.2.1. All irrigation designs for city approval must be designed by a certified irrigation designer – turf/commercial classification as certified by IIABC or IA.
- 10.2.2. Installation of low voltage wiring requires contractor to have low voltage electrical ticket as certified by the BC Electrical Safety Branch.
- 10.2.3. The contractor shall install the irrigation system in accordance with all applicable plumbing regulations.
- 10.2.4. All irrigation components and installation to comply as a minimum to irrigation industry association of British Columbia (IIABC) – standards for landscape irrigation systems.
- 10.2.5. The irrigation contractor shall be a member of the irrigation industry association of British Columbia.
- 10.2.6. A manufacturer's warranty is required for all irrigation equipment outlined in this specification and on the irrigation drawing(s).

10.3. SUBMITTALS

10.3.1. Design and Record Drawings:

- 10.3.1.1. Design Drawings: Seven (7) days prior to scheduled work, the contractor will provide the City with a set of professionally designed and drafted irrigation documents at the same scale as the project design plans with a complete list of materials for review. Drawings will indicate all components, models and materials from water supply to irrigation heads. All underground service information is to be clearly shown on design drawings.

- 10.3.1.2. Record Drawings: Upon completion, the contractor must submit 2 prints of digitally drawn as-built drawings. The prints will indicate the location of connection points, backflow preventers, sleeves, main lines, lateral lines, emitter lines, valves, controllers, and any other component installed. Dimensionally locate pressurized components and pressurized lines from buildings, curb lines or other fixed site features. Main lines, individual zones, and associated components to be drawn on separate layers. Copy of backflow test to be included.
- 10.3.1.3. Zone Map: Contractor to provide 2 laminated copies, in letter sized format, a zone map indicating type of zone (shrubs, trees, etc.), colour coded, general valve locations and valves keyed to controller station numbering. One copy is to be attached to inside of controller cabinet.

10.4. OPERATING PRESSURE STANDARDS

- 10.4.1. Irrigation system to have a dynamic operating pressure between 50 and 90psi.

10.5. MATERIALS

- 10.5.1. Plastic Pipe: Plastic pipe shall be rigid un-plasticized PVC. The pipe shall be homogeneous throughout and free from visible cracks, holes, foreign material, blisters, deleterious substances, wrinkles and dents, PVC 1120 conforming to requirements of CSA B137.3.
 - 10.5.1.1. Schedule 40 Polyvinyl-Chloride (PVC), for all pressurized lines and for hard surface sleeving.
 - 10.5.1.2. Class 200 Polyvinyl-Chloride (PVC), for all laterals.
- 10.5.2. Emitter line shall be used for the headers of all emitter lines. Tubing will conform to the requirements of CSA B137.1 and have a maximum pressure rating of 75 psi.
- 10.5.3. Automatic Control Valves
 - 10.5.3.1. Heavy-duty, 200 psi rated, Plastic, commercial grade electric remote-control valve, with flow control. Irritrol 100 Series Century Plus series valves are to be used.
- 10.5.4. Control Valve Boxes
 - 10.5.4.1. All control valves shall be installed in a rectangular thermoplastic valve access box of proper size as required for EASY ACCESS AND REPAIR to the valves. Access boxes shall be complete with approved thermoplastic cover and stainless steel bolt.

- 10.5.5. Sprinkler Heads (turf only): All sprinkler heads shall be of the types and sizes with the diameter or radius of throw, pressure, discharge and any other designations necessary for complete, head to head coverage. All critical points including corners, edges and tight contours will receive full coverage by either rectangular, triangular or edge methods of head layout. All areas of turf will be covered by a minimum of two (2) irrigation heads. All heads of a particular type and for a particular function in the system shall be manufactured by Irritrol and shall be marked with the manufacturer's name and identification, in such a position that they can be identified without being removed from the system.
 - 10.5.5.1. Rotors: T5P
 - 10.5.5.2. Rotors (sand based playfields): Toro 640 series
 - 10.5.5.3. Spray Heads: SL series
- 10.5.6. Class 200 Polyvinyl–Chloride (PVC), for all laterals
- 10.5.7. Irrigation Controller:
 - 10.5.7.1. Irritrol Total Control.
 - 10.5.7.2. Controller cabinet: to be lockable aluminum, weather proof, hinge and hasped, mounted securely, minimum 600mm above finished grade. On all installations, the cabinet will be powder coated the same colour as the adjacent street light poles. Cabinet size must be sufficient to house the controller and duplex receptacle. Locks are to be supplied by the City.
 - 10.5.7.3. Cabinet mounting: cabinet is to be mounted to 100mm square steel tubing – set in concrete base (min. 600mm depth), powder coated colour to match cabinet. Location of post to be 900mm from sidewalk, 3m min. away from intersections and preferably within shrub beds.
 - 10.5.7.4. If it is the opinion of the City Parks Manager that a controller cabinet is impractical, the controller may be housed in an approved access box.
- 10.5.8. Wire:
 - 10.5.8.1. Control: single strand copper wire TWU-40 #14 gauge.
 - 10.5.8.2. Common: single strand copper wire TWU-40 #12 gauge.
- 10.5.9. Subsurface drip emitter line:
 - 10.5.9.1. Drip-in c/w Root Guard, manufacturer; Toro Ag – 3.8 Lph, 300mm emitter spacing.
- 10.5.10. Pressure regulating module:
 - 10.5.10.1. Irritrol Omni regulating module on all drip emitter line and hanging basket zones.
- 10.5.11. Primer and Glue
 - 10.5.11.1. Appropriate primer to be used when gluing pipe.
 - 10.5.11.2. Appropriate glue to be used after primer.

10.5.12. Miscellaneous:

10.5.12.1. Disc filter: 38mm super 80 mesh, Arkal disc filter. 1 per water source, unless system has greater than 500 lineal meters of drip emitter line, then 2 per water source are required.

10.5.12.2. Hose connections: brass, 19mm male thread.

10.5.12.3. Battery operated timer: Toro DDCWP (2-4-6-8 zones).

10.5.13 Main line shall be Schedule 40 PVC installed a minimum of 450mm below grade to top of pipe in all areas. Mainline shall be 75mm or as specified by the City Parks Manager. All mainlines and lateral lines under hard surface areas shall have Schedule 40 PVC sleeves unless required otherwise by the City Parks Manager.

10.6. GENERAL INSTALLATION

10.6.1. Obtain and pay for all permits, fees and taxes associated with the installation and operation of complete irrigation systems.

10.6.2. Separate zones are required for turf, trees, shrubs, annuals, and hanging baskets.

10.6.3. Valve manifolds are encouraged to be centrally located with as many valves on (1) manifold as possible. Valves are to be attached to piping with kwik fit couplings, are not to touch each other or the valve box sides. Valve boxes are to be supported with 1 layer of bricks. Minimum distance to lid 100mm; clearance under manifold to be 300mm.

10.6.4. The Contractor shall obtain all underground service information and shall be solely responsible to locate all existing services in the vicinity, prior to commencing work.

10.6.5. Primer to be used on all pipe connections.

10.6.6. Wires are to be buried in a common trench strapped/ secured to underside of mainline.

10.6.7. Lateral lines shall be installed a minimum of 300mm below grade to top of pipe in all soft landscape areas.

10.6.8. All piping within sports fields shall be installed a minimum of 450mm below grade to top of pipe.

10.6.9. Subsurface drip emitter line is to be installed 100mm below surface of growing medium.

10.6.10. All piping shall be flushed prior to installation of subsurface drip emitter line.

10.6.11. Installation location of controller as approved by City of Langford.

10.6.12. All mainline piping shall be bedded in sand, sand depth to be 50mm on top and bottom of pipe. Laterals to be bedded in backfill material free from rocks and other unsuitable materials which could damage the pipe or create unusual settling problems.

10.6.13. All sprinklers shall be installed on swing joints using PVC 90-degree street elbows and PVC Schedule 80 nipples, no marlex fittings permitted on charged lines.

- 10.6.14. Sprinklers shall be flush mounted at finished grade.
- 10.6.15. Sprinklers shall be installed a maximum of 25mm away from any retaining wall, sidewalk or solid boundary. Curb locations are preferred.
- 10.6.16. All trees will have two emitter loops per tree as follows: (1) 1.82m diameter emitter loop and (1) 0.9m diameter emitter loop per tree, annual plantings will have a 350mm spacing for groundcover and a 450mm emitter line spacing for shrubs.
- 10.6.17. Flow rates through meters, backflow prevention devices and valves shall not exceed manufacturer specifications.
- 10.6.18. All emitter line ends to terminate into a Polyethylene header or footer to create a looped subsystem. Emitter run lengths not to exceed manufacturers recommended distances.
- 10.6.19. Each emitter zone to have a drain valve installed. Drain valve to be located at low point of emitter zone (install in a polyethylene tubing header or footer).
- 10.6.20. Each emitter zone to have a vacuum release valve installed. Vacuum release valve to be located at high point of emitter zone (install 152mm round valve box; 50mm from lid).
- 10.6.21. Drain valve and air vacuum release valve to be accessible inside a lockable 152mm round valve box.
- 10.6.22. All annual beds to have drip emitter line and to be separately zoned from shrubs and trees.
- 10.6.23. Hanging basket irrigation zones will include a separate shut off for each pole located adjacent the pole base in a 150mm round valve box.
- 10.6.24. Hanging basket irrigation zones will include a minimum 19mm horizontal supply line. The lamp standard will be supplied with a 12.5mm vertical line running inside the pole. 6mm polyethylene tubing is to be installed up to the hanging basket bracket through a nylon grommet. A suitable grommet must be installed to protect the tubing from wear.

10.7. CLEANUP & INSPECTION

- 10.7.1. Any damage to paving, planting or any other structure due to settlement of improperly compacted trenches shall be promptly repaired at the contractor's expense to the satisfaction of the City of Langford.
- 10.7.2. Surplus material shall become property of the contractor and removed from site.
- 10.7.3. All irrigation systems will require inspections by the City Engineer with 24hrs notice according to the following Table 10-1:

TABLE 10-1: Inspection Requirements

1st Inspection	Sleeving
2nd Inspection	Open Trench Main Line & Pressure Test
3rd Inspection	Open Trench Lateral Line
4th Inspection	Irrigation System, Controller & Coverage Test

- 10.7.4. The Contractor shall balance and adjust the various components of the irrigation system to ensure the efficient operation of the system. This includes the adjustment of pressure regulators, part circle sprinklers and individual adjustments of the controllers. Also make minor changes in sprinkler head locations to provide full coverage as part of work.
- 10.8. GUARANTEE
 - 10.8.1. Provide a written guarantee for all workmanship and materials for one year from the date of Substantial Completion as certified by the Project Administrator.